STUDY TITLE

Acute Toxicity Evaluation of Step I Pipe Discharge (WS006/WS007) from US Steel-MinnTac, Mountain Iron, Minnesota

DATA STANDARD

"Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms," 2002, Fifth Edition. EPA/821/R/02/012. U.S. Environmental Protection Agency, Washington, DC.

STUDY DATES

July 26-28, 2016

STUDY SUBMITTED

August, 2016

TESTING FACILITY

Pace Analytical
4730 Oneota Street
Duluth, MN 55807

Tel. No. (218) 727-6380

PROJECT IDENTIFICATION NUMBERS

Pace Project # 1271183

NPDES Permit No. MN0057207

1.0 EXECUTIVE SUMMARY AND RESULTS

MinnTac Step I Pipe Discharge (WS006/WS007), Mountain Iron, MN was evaluated for acute toxicity to fathead minnows (*Pimephales promelas*) during July 26-28, 2016. McNiven Creek Water (SW002) was used as the dilution and primary control water for the test. Moderately hard reconstituted water (MHRW) was used as the laboratory reference control water for the tests. The table below summarizes the toxicity results of the tests.

Fathead Minnow
48 Hour LC_{50}: >100%
(95% C.I. Not Calculable)
Survival NOEC: 100%
Survival LOEC: --
Toxicity Units (TUa): <1.00

The chemistry determinations for the final effluent samples are attached at the end of this report. The data package and statistical analysis for the test battery is also attached.

2.0 GENERAL INFORMATION

Data Standard	EPA/821/R/02/012	
Testing Facility	Pace Analytical, 4730 Oneota Street, Duluth, MN 55807, Tel. No. (218) 727-6380	
Project Director	Dan Toms	
Test Dates	July 26-28, 2016	
Report Approval	Dan Toms	Report Signature: Dan Toms

3.0 OBJECTIVE

To determine the median lethal concentration (LC_{50}), no- & lowest- observed effect concentrations (NOEC & LOEC) based on survival of MinnTac Step I Pipe Discharge (WS006/WS007) for fathead minnows.

4.0 REFERENCES

American Public Health Association (APHA). 1998. 20th Ed. of Standard Methods for the Examination of Water and Wastewater. APHA, Washington, D.C.

USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms. Fifth Edition. EPA/821/R/02/012. U.S. Environmental Protection Agency, Washington, DC.

MPCA Acute Toxicity Test Conditions for Static Renewal Whole Effluent Tests. Minnesota Pollution Control Agency.

West Inc. & University of Wyoming. TOXSTAT Software Package Version 3.5.

5.0 TEST METHODS

Test Concentrations: 0 (dilution water control), and 100%.

Test Organisms: Fathead minnow (*Pimephales promelas*) 7 days old.

Test Chambers: Fathead minnow: 800 mL glass beakers.

Incubation: *Duration*: 48 hours. *Renewals*: None

Observations: Survival was recorded each day. The test was terminated following 48 hours of exposure.

Endpoint Calculations: LC_{50} USEPA Statistical Programs. NOEC and LOEC: TOXSTAT statistical software, Version 3.5, West, Inc., and University of Wyoming.

6.0 DEVIATIONS FROM REFERENCED METHOD

To the best of our knowledge, no deviations from the referenced method (EPA-821-R-02-012) occurred for the study.

Cumulative Percentage of Surviving Organisms for Selected Test Species Exposed to MinnTac Step I Pipe Discharge (WS006/WS007) Tested July 26-28, 2016

Effluent Concentration (%)	Test Interval	
	24 hour	48 hour
Fathead Minnow		
0 (MHRW)[a]	100[c] (20/20)[d]	100 (20/20)
0 (RW)[b]	100 (20/20)	100 (20/20)
100	100 (20/20)	100 (20/20)

[a] Secondary Control was Moderately Hard Reconstituted Water (MHRW)
[b] Primary Control Water was McNiven Creek Water (SW002)
[c] Cumulative Percentage Survival
[d] # Alive/# Exposed

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Acute Whole Effluent Toxicity Test Report

NPDES Permit Program

Doc Type: Effluent Limit Standards Review

Please read all instructions carefully before completing each section of the report. **Instructions are found on Page 5.**

Address the completed, signed report to: Attn: Water Quality Submittals
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Facility Information

Permit No.: MN0057207 Station ID: WS006/WS007

Name of permittee: US Steel Minntac

Test Information

Test start date (*mo/day/year*): 7/26/16 Test end date (*mo/day/year*): 7/28/16

or

☐ Check if **no discharge occurred** and **leave the rest of the form blank.**

Report completion date (*mo/day/year*): 8/12/16

WET test type (*check one*): ☒ Initial ☐ Repeat #1 ☐ Repeat #2 ☐ TAC Repeat

For repeats, test start date of initial WET test (*mo/day/year*):

Dilution water (*check one*): ☐ Lab ☒ Receiving water

If receiving water, indicate name: McNiven Creek Water (SW002)

Test lab name:: Pace Analytical Phone: (218) 727-6380

Mailing address: 4730 Oneota Street

City: Duluth State: Minnesota Zip code: 55807

Lab representative name: Dan Toms E-mail: dan.toms@pacelabs.com

Facility representative name: Thomas Moe E-mail: tmoe@uss.com

Sample condition upon test initiation

Sample	Collection date	Receipt date	First use date	pH (SU)	Conductivity (umhos/cm)	TRC (mg/L)	Temp °C Arrival at lab	Temp °C upon test initiation	Total Ammonia (mg/L)	Alkalinity (mg/L)	Hardness (mg/L)
Receiving Water 1	7/25/16	7/25/16	7/26/16	8.2	96.8	< 0.02	18.7	25	< 0.20	42.4	56.0
Receiving Water 2*											
Receiving Water 3*											
Receiving Water 4*											
Effluent 1	7/25/16	7/25/16	7/26/16	8.1	2010	< 0.02	22.2	25	1.6	190	992
Effluent 2*											
Effluent 3*											
Effluent 4*											

**If applicable* *umhos/cm = micromhos per centimeter* *mg/L = milligrams per Liter (mg/L)*

Does facility have chlorine limit? (*check one*) ☐ Yes ☒ No

Was sample dechlorinated at lab? (*check each one that applies*)

☐ Effluent 1 ☐ Effluent 2 ☐ Effluent 3 ☐ Effluent 4

Effluent filtered? *(check one)* ☐ Yes ☒ No If yes, state mesh size: _____

Effluent sample type (*check one type for each sample*):

Effluent 1:	☐ 24 hr composite	☒ Grab	☐ Grab-composite – Enter number of grabs: _____
Effluent 2:	☐ 24 hr composite	☐ Grab	☐ Grab-composite – Enter number of grabs: _____
Effluent 3:	☐ 24 hr composite	☐ Grab	☐ Grab-composite – Enter number of grabs: _____
Effluent 4:	☐ 24 hr composite	☐ Grab	☐ Grab-composite – Enter number of grabs: _____

Summary of data for Fathead Minnows – Percent survival per concentration

Day	0_1 (diluent)	0_2 (if used)	%	%	%	%	100%
1	100	100					100
2	100	100					100
3							
4							

Summary of data for *Ceriodaphnia dubia* – Percent survival per concentration

Day	0_1 (diluent)	0_2 (if used)	%	%	%	%	100%
1							
2							

Summary of data for *Daphnia magna* – Percent survival per concentration

Day	0_1 (diluent)	0_2 (if used)	%	%	%	%	100%
1							
2							

Summary of results – Acute values

Species	LC_{50}	TU_a (acute toxic units)
Fathead Minnow (96 hour)	>100%	<1.00
Ceriodaphnia dubia (48 hour)		
Daphnia magna (48 hour)		

Test Acceptability Criteria (TAC)

QA/QC Criteria	Criteria met for Acute Toxicity
Fathead Minnow – Age range <24 hours at test start	☐ Yes ☒ No
Ceriodaphnia dubia – Age range <24 hours at test start	☐ Yes ☐ No
Daphnia magna – Age range <24 hours at test start	☐ Yes ☐ No
Test started within 36 hours of collection of sample	☒ Yes ☐ No
90% or greater survival of all control organisms (if any species results fail, check No)	☒ Yes ☐ No

If reference toxicant other than NaCl used, please indicate: _____

Test deviation comments

Describe any deviation from test methods: **Per permit requirements only 48 hour fathead minnow test performed with no dilution.**

(For example: pH-controlled test amount of CO_2, reduced DO levels in test leading to aeration, sample exceeded holding time.)

Certifications

Form shall be signed by the laboratory here certifying the results:

Lab representative (print): Dan Toms Phone: (218) 727-6380

Signature: Dan Toms Date: 8/12/16

Form shall be signed by the permittee here in accordance with Minn. R. 7001.0540 Certification of Permit Applications and Reports

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Permittee representative (print): Tom Moe Phone: (218) 749-7485

Signature: Date:

Attachments provided:

Data package, Narrative report, Reference Toxicant Chart (Reference test met requirements).

Whole Effluent Toxicity Test Instruction Sheet

This instruction sheet is provided to aid in filling out the Acute or Chronic Whole Effluent Toxicity (WET) Test report forms as required by your National Pollutant Discharge Elimination System (NPDES) Permit. If your permit requires acute WET testing, there will be one form to fill out. If your permit requires chronic WET testing, there will be two forms to fill out.

Section 1. Facility Information

Fill out your NPDES permit number, discharge outfall station identification (ID) number, and your Permittee name as it appears on your NPDES permit.

Section 2. Test Information

Test Start Date/Test End Date. Fill out the date the test began (month/day/year), the date the test finished (month/day/year)

No discharge. This box should be checked if no discharge occurred during the WET monitoring period. If no discharge occurred, the rest of the form is left blank, and should be signed, dated, and submitted by the required date.

Report Completion Date. Fill out the completion date, which is the date the report is sent from the testing laboratory as indicated on the test report (month/day/year).

WET test type. Select the appropriate form to fill out. This will be either the acute test form, or both the Fathead chronic minnow form and the *Ceriodaphnia* chronic form. Check the appropriate test represented by this report; either Initial, Repeat#1, Repeat#2, or TAC Repeat

Dilution water. Check either lab or receiving water, whichever was used to dilute the effluent sample to create the test series concentrations. If receiving water is used as the diluents, supply the name of that receiving water.

Test Lab Name, etc. Provide the name, phone number, address, lab representative name, and e-mail address.

Facility representative name. Provide the name of the discharging facility's representative and e-mail address.

Sample condition table. The laboratory conducting the tests must fill in the sample information and dates associated with the samples received. The information is typically collected for Chain of Custody forms and for initial sampling upon initiating a test. Provide the date the sample was collected, receipt date at the lab, date of first use for testing, pH, specific conductivity, total residual chlorine (TRC) analysis, temperature upon arrival at the lab and temperature at test initiation, total ammonia analysis, total alkalinity, and total hardness. Sample data will be provided for each sample received and as specified by the applicable acute or chronic manuals, or by the permit. Up to four samples each may be received for the receiving water and effluent for acute tests. Up to three samples may be received for chronic tests for the receiving water. Fill in any data that is below quantification levels with a less than sign and that actual quantification level (e.g. <40 ug/l) – **do not report ND**.

Does facility have a chlorine (TRC) permit limit? Check either Yes or No.

Was sample dechlorinated at the lab? Check each sample that was dechlorinated at the lab.

Effluent filtered? Check either Yes or No, and state the mesh size used for filtration.

Effluent sample type. For each sample collected check or check whether the sample was a twenty-four hour composite, a grab, or a grab composite with the number of grabs taken to comprise the composite sample.

Summary of data for each species for acute or chronic tests, as applicable in your permit. For each species in an acute test summarize the cumulative survival data over all replicates for each treatment level for each day of the test. Fill in the dilution series expressed as percent effluent as specified by the permit. Reaffirm which sample of either receiving water or lab water was used as the diluent (0_1) based on your answer in section 2 *Test Information – Dilution water.*

For a Fathead minnow chronic test summarize the cumulative 96 hour survival data over all replicates, the cumulative mean 7-day biomass data, and the 7-day cumulative mean percent survival data for each treatment level for the test. Fill in the dilution series expressed as percent effluent as specified by the permit. Reaffirm which sample of either receiving water or lab water was used as the diluent (0_1) based on your answer in section 2 *Test Information – Dilution water.*

For a *Ceriodaphnia* chronic test summarize the cumulative 48 hour survival data over all replicates, the cumulative mean 7-day reproduction/female data, and the 7-day cumulative mean percent survival data for each treatment level for the test. Fill in the dilution series expressed as percent effluent as specified by the permit. Reaffirm which sample of either receiving water or lab water was used as the diluent (0_1) based on your answer in section 2 *Test Information – Dilution water.*

Summary of results table for each species for acute or chronic tests, as applicable. For acute tests provide the appropriate 48 or 96 hour LC50 values for each species and the calculated toxic unit values (TUa for acute or TUc for chronic tests).

For Fathead minnow chronic tests provide the calculated IC_{25} for larval survival and growth at the end of the test as well as the critical No Observed Effect Concentration (NOEC) and Lowest Observed Effect Concentration (LOEC). Also provide the chronic toxic units (TUc) calculated as the inverse of the IC_{25} value.

For *Ceriodaphnia* chronic tests provide the calculated IC_{25} for survival and reproduction at the end of the test as well as the No Observed Effect Concentration (NOEC) and Lowest Observed Effect Concentration (LOEC). Also provide the chronic toxic units (TUc) calculated as the inverse of the IC_{25} value.

Test acceptability criteria. For acute tests check the corresponding boxes either yes or no for each of the Quality Assurance/ Quality Control (QA/QC) criteria.

For chronic tests check the corresponding boxes either yes or no for each of the QA/QC criteria. If there is deviation from the specified methods, please describe the change and reason for the deviation. PMSD is the percent minimum significant difference from hypothesis testing that characterizes overall test variability. The temperature variation of $\pm 1^{\circ}$ C is for individual measured test chambers over a test.

Deviations from test methods. If there is any deviation from the specified methods, please describe the change and the reason for the deviation. This is a narrative comment area to describe any unusual circumstances in conducting any of these tests.

Certifications. Provide the laboratory representative name, signature, phone number and date for the tests completed. Also provide the permittee representative name, signature, phone number and date for the tests completed. The Permittee is responsible for forwarding these results to the Minnesota Pollution Control Agency.

Attachments. Attach any narrative regarding results or SOP, bench sheets for analytical and biological data, chain of custody forms, reference test results for tested species (tables and/or charts over the past year), and toxicity calculation outputs.

WO#: 1271183

PM: DJT Due Date: 08/15/16

CLIENT: USS CORP

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Docu

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be c

Page: 1 Of 1

Section A Required Client Information:		Section B Required Project Information:	Section C Invoice Information:
Company: U.S. Steel-Minntac		Report To: Tom Moe	Attention:
Address: 8771 Park Ridge Dr		Copy To:	Company Name:
Mountain Iron, Minnesota 55768			Address:
Email To:		Purchase Order No.	Pace Quote Reference:
Phone: 218.749.7485	Fax: 218.749.7360	Client Project ID:	Pace Project Manager:
Requested Due Date/TAT:		Container Order Number:	Pace Profile #:

Requested Analysis Filtered (Y/N) — Site Location: Minnesota

ITEM#	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Residual Chlorine (Y/N)	Remarks
1	~~WS001~~ WS006 / WS007	WW	G	7/25/16		1150			4	2	1	1						001	22.2C
2	SW002	WW	G	7/25/16		1230			4	2	1	1						002	18.7°C
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			

Analyses Filtered (Y/N): pH, Cond, Hard, Alk, Ammonia, Total Residual Chlorine, FM Acute

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	TOM MOE/USS	7/25/16	1300	Kristina Polson	7/25/16	1445		Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: THOMAS A. MOE

SIGNATURE of SAMPLER: Thomas A. Moe DATE Signed: 7/25/16

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 22Jan2016 Page 1 of 1
	Document No.: F-DUL-C-001-Rev.01	Issuing Authority: Pace Virginia, Minnesota Quality Office

WS006 | WS007

Sample Condition Upon Receipt

Client Name: US Steel - Minntac

Project #: WO# : 1271183

1271183

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace ☐ Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No **Seals Intact?** ☐ Yes ☒ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other: _____ **Temp Blank?** ☒ Yes ☐ No

Thermometer Used: ☒ B00051 **Type of Ice:** ☒ Wet ☐ Blue ☐ None ☒ Samples on ice, cooling process has begun

Cooler Temp Read °C: 23.0 **Cooler Temp Corrected °C:** 22.2 **Biological Tissue Frozen?** ☐ Yes ☐ No ☒ NA

Temp should be above freezing to 6°C Correction Factor: -0.8 °C **Date and Initials of Person Examining Contents:** 7/25/16 kp

				Comments:
Chain of Custody Present?	☒ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☒ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☒ Yes	☐ No	☐ N/A	3.
Sampler Name and Signature on COC?	☒ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☒ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☒ Yes	☐ No	☐ N/A	6. pH, resel
Rush Turn Around Time Requested?	☐ Yes	☒ No	☐ N/A	7.
Sufficient Volume?	☒ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☒ Yes	☐ No	☐ N/A	
Containers Intact?	☒ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC?	☒ Yes	☐ No	☐ N/A	12.
-Includes Date/Time/ID/Analysis Matrix: WT				
All containers needing acid/base preservation will be checked and documented in the pH logbook.	☒ Yes	☐ No	☐ N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	☐ Yes	☐ No	☐ N/A	13.
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☐ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☐ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased): _____				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Tom Moe Date/Time: 7/26/16 9:30AM

Comments/Resolution: Contacted Client about samples received over temp. Client gave permission to proceed with testing. DB 7-26-16

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: AP for MF **Date:** 7-26-16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical®	Document Name: Sample Condition Upon Receipt Form	Document Revised: 22Jan2016 Page 1 of 1
	Document No.: F-DUL-C-001-Rev.01	Issuing Authority: Pace Virginia, Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: SW002 US Steel - Minntac

Project #: WO#: 1271183

PM: DJT Due Date: 08/15/16

CLIENT: USS CORP

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace ☐ Other: _____

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No **Seals Intact?** ☐ Yes ☒ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other: _____ **Temp Blank?** ☒ Yes ☐ No

Thermometer Used: ☒ B00051 **Type of Ice:** ☒ Wet ☐ Blue ☐ None ☒ Samples on ice, cooling process has begun

Cooler Temp Read °C: 19.5 **Cooler Temp Corrected °C:** 18.7

Temp should be above freezing to 6°C Correction Factor: -0.8 °C **Date and Initials of Person Examining Contents:** 7/25/16 kp

Biological Tissue Frozen? ☐ Yes ☐ No ☒ NA

				Comments:
Chain of Custody Present?	☒ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☒ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☒ Yes	☐ No	☐ N/A	3.
Sampler Name and Signature on COC?	☒ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☒ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☒ Yes	☐ No	☐ N/A	6. pH, resCl
Rush Turn Around Time Requested?	☐ Yes	☒ No	☐ N/A	7.
Sufficient Volume?	☒ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☒ Yes	☐ No	☐ N/A	
Containers Intact?	☒ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	11. Note if sediment is visible in the dissolved containers.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☒ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation will be checked and documented in the pH logbook.	☒ Yes	☐ No	☐ N/A	See pH log for results and additional preservation documentation
Headspace in Methyl Mercury Container	☐ Yes	☐ No	☐ N/A	13.
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☐ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☐ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased): _____				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

FECAL WAIVER ON FILE Y N TEMPERATURE WAIVER ON FILE Y N

Project Manager Review: A P for MF **Date:** 7-26-16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

MinnTac

Pace Analytical

Client: MinnTac

Pace Project #: 1271183

Test: Acute Toxicity Evaluation

Test Initiation Date: July 26, 2016

Test Termination Date: July 28, 2016

ENVIRONMENTAL SAMPLE TEST INFORMATION

Date: July 26, 2016
Client: MINNTAC
Pace Project #: 1271183
Dilution Water: SW002
Test Chamber: 800 mL glass
Food: None
Temperature: 25°C
Test Organism(s)/Age: Fathead Minnow/7 day
Comments:

TOXICITY TEST RENEWAL FORM

CLIENT: MINNTAC

PACE PROJECT #: 1271183

TEST: Acute Toxicity Evaluation

TEST INITIATION DATE: July 26, 2016

ORGANISM: Fathead Minnow

TERMINATION DATE: July 28, 2016

TEST DAY	0 Test Initiation	1	2	3	4
DATE	7/26/16	7/27/16	7/28/16		
TIME OF READING				--	--
				--	--
	FHM 1456	FHM 1421	FHM 1417	FHM	FHM
TIME OF FEEDING	—	—	—		
DILUTION WATER	RW 1271183-002	RW 1271183-002	RW 1271183-002	RW	RW
	MHRW 16-040	MHRW 16-040	MHRW 16-040	MHRW	MHRW
INITIALS	AR	AR	CJA		

INITIAL CHEMISTRIES

CLIENT: MINNTAC

Pace Project #: 1271183

TEST: Acute Toxicity Evaluation

TEST INITIATION DATE: July 26, 2016

ORGANISM(S): Fathead Minnow

TEST TERMINATION DATE: July 28, 2016

	7/26/16 CJA /	7 /
CONCENTRATION: **MHRW**		
pH (su)	8.15	
DO (mg/l)	8.0	
Cond (umhos/cm)	328	
CONCENTRATION: **SW002 Receiving Water**		
pH (su)	7.27	
DO (mg/l)	7.9	
Cond (umhos/cm)	~~100~~ + CJA 7/26 96.7	
CONCENTRATION: **100% (WS006/007) 100% Effluent**		
pH (su)	8.17	
DO (mg/l)	7.9	
Cond (umhos/cm)	2070	
Daily Temperatures		
2	24.5	

FINAL CHEMISTRIES

	7/27/16 / CLC	7/28/16 / CJA
CONCENTRATION: **MHRW**		
pH (su)	7.92	8.0
DO (mg/l)	8.3	8.0
CONCENTRATION: **SW002 Receiving Water**		
pH (su)	7.32	7.66
DO (mg/l)	7.9	7.9
CONCENTRATION: **100% (WS006/007) 100% Effluent**		
pH (su)	8.18	8.35
DO (mg/l)	8.1	8.0
Daily Temperatures		
Bath# 2	24.5	24.6

ACUTE TOXICITY DATA LOG

Client: MINNTAC	Species: Fathead Minnow
Project #: 1271183	Age: 10 day
Test: Acute Toxicity Evaluation	No. Animals/No. Reps: 10/2
Test Initiation Date: July 26, 2016	Sources of Animals: ABS
Investigator: Toms	Dilution Water/Control: River Water
Test Duration: 48 hour	Test Volume: 600 mL
Renewal: **None** / Daily / Other	Test Temperature: 25°C
	Minimum Control Survival ≥ 90%:(Y / N)

Concentration	Survival Readings: (# alive out of # exposed from above unless shown otherwise)			
	24 Hour Replicate A B	48 Hour Replicate A B	72 Hour Replicate A B	96 Hour Replicate A B
MHRW	10 10	10 10		
SW002 (RW)	10 10	10 10		
WS006/007 (100% Eff)	10 10	10 10		
	Dated Initials 7/27/16 CJA	Dated Initials 7/28/16 CJA	Dated Initials	Dated Initials
Comments:				